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increase. The results and estimates for the date 1905 are appended here.

TABLE IX.

CITY.	ANTHROPOGRAPHIC CITIES.				
	AREA, MILES.	POPULATION.	ANNUAL INCREASE.	POPULATION 1905.	PER SQ. MILE.
London. . . .	1901... 139	5,327,000	65,000	5,581,000	40,000
New York. . .	1900... 72	3,636,000	119,200	4,232,000	59,000
Paris. . . . .	1896... 44	2,874,000	33,000	3,173,000	72,000
Berlin. . . . .	1905... 44	.....	27,700	2,584,000	59,000
Vienna. . . . .	1900... 48	1,600,000	35,000	1,775,000	37,000
Chicago. . . .	1900... 72	1,500,000	51,700	1,758,000	24,000
Philadelphia.	1900... 38	1,142,000	26,200	1,273,000	33,500
Boston. . . . .	1900... 27	681,000	15,000	756,000	28,000
St. Louis. . . .	1900... 24	575,000	10,700	554,000	23,000

The method of estimating the annual increase is very crude, yet the writer believes it is within one or two thousand of the truth. If the values were projected forward to 1910 we should get so far away from our base of facts that they would merit much less confidence. The above values are presented as the first series of comparable ones worked out. The singularly rapid growth of New York is apparent at once. If the rates remained constant it would have the same population as London in 1930.

## BERNHARD HANTZSCH'S NOTES ON NORTHEASTERN LABRADOR.\*

BY

ROBERT STEIN.

Works that give a clear picture of the face which nature wears in Arctic lands and seas are none too numerous, and hence are hailed with special satisfaction. When informed that on one of the Peary expeditions over 400 musk oxen were shot, most people ask in astonishment: What do these animals feed on? It takes some time to make them understand that the total of 400 was made up of small herds distributed over a country as large as Ireland. But what do they live on during the winter, when the snow covers everything? Great is the average reader's astonishment on learning that, on

\* Beiträge zur Kenntniss des nordöstlichsten Labradors. Von Bernhard Hantzsch. *Mitteilungen des Vereins für Erdkunde zu Dresden.* Heft 8. Dresden, 1909. Pages 169-229.

Arctic lands free from inland ice, the cover of snow never remains unbroken more than a few days, but is likely to be blown away from level surfaces by the first wind, leaving the vegetation far more accessible than in many a temperate land.

The reader who rises from perusal of the paper described in the title will give emphatic assent to Hantzsch's modest hope that it may be "worth publishing." Not many corners in Northeast America have been so fully portrayed in 61 pages as the terminal point of the northeastern peninsula of Labrador, which was the scene of his explorations. Primarily undertaken as an experimental trip preliminary to the ornithological exploration of Baffinland, the voyage added interesting data to our knowledge of the geography, geology, zoology, botany and ethnology of northeastern Labrador.\*

The north coast of Labrador, forming the south shore of Hudson Strait, is divided by Ungava Bay into two peninsulas, a broad western and a narrow, triangular eastern one, terminating in Cape Chidley, which forms the southern gatepost of the mouth of Hudson Strait, the northern gatepost being formed by Resolution Island. Cape Chidley, however, is not really the terminal point of the Labrador mainland, but is situated on an island as yet nameless, roughly 20 miles square, separated from the mainland by a strait, 25 miles long and for the most part about a quarter of a mile wide, and running almost due east and west, called MacLelan Strait. On A. P. Low's map in "The Cruise of the Neptune," a second strait is marked with dotted lines a little farther south, but Hantzsch says that no such strait exists. At the western end of MacLelan Strait, and on its north side, in a bay called Port Burwell, is situated the mission station of Killinek, which the author had selected for his headquarters. Emerging from the fog of the Labrador coast, the mission ship "Harmony" from London, on which he had taken passage, found itself on July 24, 1906, off the east end of Resolution Island. The entire north side of Hudson Strait was open, with numerous icebergs, but very little sea ice, the latter having been crowded southward, where it formed what seemed an impenetrable belt, barring the approach to the north coast of Labrador. On the north side of the strait the drift of the ice was inward, toward Hudson Bay; on the south side outward, toward the Atlantic. Eleven days were spent in steaming to and fro in the hope of discovering an open lane of water leading southward through the belt of ice. At last, on August 4, the ice having shown signs of loosening, the ship,

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\*The conclusion of Mr. Hantzsch's paper appears in the same publication, No. 9, and is devoted to the Eskimos living in the region he explored.

after five hours of fierce struggle, emerged into open water along the south shore and cast anchor in Port Burwell. On August 5 the party landed and Hantzsch took up his abode at the mission station of Killinek. On August 22 the steamer started homeward, leaving him and the missionaries to their own resources.

Killinek station seems destined to become a central point for the whole vicinity. Established in 1885 as an observation station, it soon attracted a number of natives. Since the beginning of the nineties, the firm of Job Brothers, of St. John's, Newfoundland, have sent, every year, a steamer to those waters, mainly for the codfish business. In 1898 that firm erected four small wooden dwellings. The missionaries of the Moravian Brothers of Labrador thereupon began to visit the station. In 1904 the property was sold by Job Brothers to the London Society for the Furtherance of the Gospel. More Eskimo families took up their abode near by, and erected three houses, till in the winter of 1906-7 the number of natives rose to 105. The white man's presence here, as in Greenland, causes a greater concentration of the native population, the outlying settlements being even abandoned. From the white man they obtain seal nets, fox traps and other products of civilization, in exchange for the products of the chase, and hence they soon become dependent on him to such extent that the discontinuance of a station becomes a veritable calamity. Mission houses have a special attraction for them, because apt to be more just than private traders, who are forced to make the most advantageous terms for themselves in a trade which at best is not very lucrative. On two visits, the Governor of Newfoundland, Sir William MacGregor, pronounced a very favourable opinion on the prospects of the settlement. However, the question whether the station is to belong to Newfoundland or to Canada is as yet undecided. In case Canada assumes possession, a lighthouse and a government building for revenue purposes are to be erected. As a central point for Hudson Strait and even for the whole region as far as Davis Strait, Killinek, in the author's opinion, is the best locality, its port being free from ice for a longer period than any other port in that region. This view is shared by A. P. Low, who visited the station in the *Neptune*.

Immediately on landing, Hantzsch yielded to the impulse most natural to the visitor of an Arctic land: to plunge into the midst of the Arctic nature and revel in its novelty. It is somewhat surprising to find from his description and photographs that this region, 2,100 miles from the Pole (Cape Chidley, 60° 34' N. Lat.) is so thoroughly Arctic in character, hardly differing from Grinnell Land,

only 700 miles from the Pole. The 60th degree, after grazing Cape Farewell, the south point of Greenland, and leaving Iceland 460 miles to the north, traverses the Shetland islands, leaves Bergen a few miles to the north, touches Christiania, passes a little to the north of Stockholm, then close by Helsingfors and St. Petersburg, then through the middle of Siberia, cuts the neck of Kamtchatka peninsula and again that of Alaska Peninsula, hits Mount St. Elias, divides Canada into two almost equal halves, and completes the circuit of the globe by cutting off the northern third of Hudson Bay. Where it intersects the west shore of Hudson Bay, it crosses the line marking the limit of tree growth, which thence trends northwestward, reaching the 68th degree in Alaska and the 70th degree in Norway. In other words, the 60th degree, in running around the globe, touches no treeless land, except in nature's stepchild, Labrador. In looking at one of the author's photographs, "Typical landscape near Killinek (freshwater lake), 9 August," showing patches of snow close to the water's edge, the effect is heightened by the reflection that the same sun which was unable to melt that snow, only a few feet above sea level had looked down that day, in exactly the same latitude in the Old World, on smiling fields, gardens and orchards, and great cities, whose inhabitants were fain to seek the shade and fan themselves.

Every one who has passed along the Labrador coast has been struck by the peculiar appearance of the sky line. It is probably unique on the globe. There are no long, smooth sweeps of curves as in the wooded mountains of milder climes, nor sharp peaks and saw-toothed crests like those of the Alps or Rocky Mountains, but an infinity of little wrinkles, resembling nothing so much as cauliflower. Hantzsch's description and photographs supply the explanation. It is the result of ice work. All the sharp projections have been planed away by the ice sheet which at one time overspread all Labrador, eastern Canada and the northeastern United States. The tops of the ridges and crags have been ground down till they are as smooth as a marble floor. No vegetation can find a lodgment on such surfaces, not because the wind blows there with unusual violence, but because there is little rock decay and hence no foothold even for the spore of a lichen. Another source of joy to the stroller over Arctic lands are the level floors of fissures between rock walls, paved with the *débris* of ancient moraines, making a veritable macadam, as smooth as a gravel walk in a park. However, neither the tables or shelves of planed rock nor the graveled avenues of the fissures ever run far in the same direction. In the main, overland travel is a succession of climbs or jumps, of perpetual turns to right

and left, and occasionally a wide detour to circumvent a chasm or a vertical wall. Now and then a gorge will be found filled with boulders of all sizes, rounded as cannon balls, probably the product of furious whirlpools that seethed and roared beneath the ancient ice cap. Could mortal eye but gaze beneath the immense ice cap of Greenland, apparently so rigid, what scenes of tumult might be revealed!

One of the pleasantest features of this Arctic landscape are the thousands of little freshwater lakes, of crystalline purity, charming the eye by their very solitude. Most of them are shallow and of small extent, but some are of considerable size and depth. They occupy either basins scooped out of the solid rock by the ancient ice, or the floor of gorges dammed by moraines. Organic life in them is rather scanty. Cascades of all sizes are frequent. The wider valleys are apt to be occupied by swamps, covered by a carpet of grass, moss and willow, generally strong enough to bear the weight of a man, but occasionally luring him to a knee-deep plunge into the tenacious mud beneath.

With the delight of the true naturalist, Hantzsch next turns to the vegetal and animal life. As might be expected from the continuity with the Canadian mainland, that life is rather more abundant than in Greenland or the Arctic archipelago. It is indeed difficult to describe the pleasure one feels when, after walking for an hour over naked or at most lichen-coated rock, one suddenly comes upon a little sunny spot in the shelter of a rock wall, where a talus slope or the bed of an ancient glacier brook is gay with the yellow of the poppy or dandelion, the white of the saxifrage or the purple of the crowberry. Presently a butterfly, flitting from flower to flower, adds to the surprise by the suggestion of balmy days in brighter climes; or a humble bee may come buzzing about the traveller's head, generally much too swift and erratic for his net. The crowberry and huckleberry bushes are fairly alive with tiny gnats, so small that they disappear from sight almost as soon as seen, but suggesting an answer to the question how the innumerable little spiders earn their livelihood. Here and there a hairy caterpillar will be seen crawling in desperate hurry to a hiding-place, or if a plant be pulled up for a botanical specimen, a naked caterpillar will be found gnawing at its root. The dwarf willow and dwarf birch generally form an inextricable tangle with each other and with the moss and grass, so that it is almost impossible to obtain whole specimens, yet occasionally, spreading from a small fissure, where no other vegetation forestalled it, one of these beautiful representa-

tives of arboreal life may be seen forming an almost perfect circle, four or five feet in diameter, with its yellow stems running with almost geometric regularity from center to periphery. Why do they cling to the rocks, which of course are as cold or colder than the air, is the question which at once suggests itself. The reason is the same that causes the Eskimo to stoop when walking through a blizzard, and to put a foxtail as a guard around his face: to gain the protection of a layer of air as nearly stagnant as possible. Loss of heat by conduction neither animal nor plant fears in the Arctic, both being as a rule amply provided with non-conductors; it is the loss of heat by convection that is apt to be fatal.

As might be expected of an ornithologist, the author devotes most attention to the plumed fauna. Of land birds, indeed, there are not many: the snow bunting, whose merry song is heard almost constantly on every grassy slope; the ptarmigan, wonderfully pretty both in summer and winter dress; the raven, talking to its fellows in almost human tones, and changing its croak to a remarkably musical, metallic note in the love season. However, while the land is poor, the sea is rich, and thus the feathered tribe, like the "rational animal," is mainly found along the shore, looking steadily seaward for its breakfast, dinner and supper. In one respect this corner of Labrador seems to be less favoured than regions farther north or south, namely, in that so few species breed there. Out of the 98 species listed by Hantzsch, only 30 are recorded as breeding in this locality, and even of these, many are said to do so only occasionally. The great majority are described as "transients" or "visitors." One of the great attractions of northern Greenland and Baffinland is thus denied to this region, namely, the great colonies of looms, kittiwakes and especially of the dovebies, whose swarms, circling over their breeding places, look at a distance like the smoke from a chimney. In the Smith Sound region, at the northern end of Baffin Bay, on the contrary, there seem to be no "transients" at all; every species breeds, for the very good reason that they are there pretty close to the northern end of the land and especially to the northern end of permanently open water. It is fortunate that at the very moment when the animal wealth of these northern waters and the possible mineral wealth of these northern lands is beginning to attract attention, the Canadian Government has become interested in the "Conservation of Natural Resources for the Benefit of Posterity," so that the musk ox, seal, walrus, loom and dovebie may not have to share the fate of the reindeer of South Greenland and of the whale of Baffin Bay and Hudson Bay, or, worse yet, of the great auk. It

would be unpardonable if the "land of desolation" were allowed to be made still more desolate by being robbed of its most important resources.

Among fishes, the author mentions the cod, which seems to be abundant enough to be of commercial importance, and the capelin, caught in such quantities that one wonders how there can ever be danger of famine either in Newfoundland or in Greenland. Salmon are not caught at Killinek as a rule, though a little farther south their capture is carried on systematically on both coasts by the employees of the Hudson Bay Company. Sharks, sometimes 30 feet long, do great damage by getting caught in the seal nets and destroying them in their efforts to escape. The author gives no list of the seals found in the adjoining waters, though his incidental references to them prove that they are abundant, the sea in that vicinity being a seething mass of shrimps, the main food of the seal. Whoever knows of the veritable meadows of seaweed that cover the bottom of Arctic seas will no longer marvel at the wealth of animal life. In fact, studies in the North have pointed out\* that for many marine organisms, the life conditions in the Arctic are actually more favourable than those of temperate and tropical seas, principally because of the practical uniformity of temperature, which does not vary more than about 5 degrees F. on either side of freezing point throughout the year. According to Dr. Hugh M. Smith† two million dollars' worth of seaweed is sold in Japan every year, besides large quantities which are consumed on the spot. Baffin Bay is a mass of seaweed, and Eskimo labour is probably cheaper even than Japanese.

Between August 11 and September 11, the author undertook two excursions, one southward along the shore of Ungava Bay, the other through MacLellan Strait to the islands on the Atlantic coast. On both occasions he was accompanied by an Eskimo man, Paksau by name, possessing many good and few ill qualities. Even in the short distance of half a degree of latitude—the extent of the southward journey—the vegetation grew decidedly more abundant, the topography less rugged, the land lower, and covered to a greater extent by soil and swamp, showing a change to a more continental character. At the south end of Ungava Bay, according to the Atlas of Canada, stunted conifers begin to make their appearance. The passage through MacLellan strait suggested reflections regarding its

\* See Johannes Walther, "Einleitung in die Geologie als historische Wissenschaft," Jena, 1893-94, page 52.

† *Bulletin* 24, U. S. Bureau of Fisheries.



navigability. It remains free from ice for a longer period than either Hudson Strait or Gray Strait (between Cape Chidley and the Button islands, a small group about five miles to the north), and its width and depth are all that could be desired, but a serious obstacle may be found in the furious tidal current which carried cakes of ice past the author's camp "literally with the speed of a railway train," and which prevents the strait from being frozen even in midwinter. Having reached the eastern end of the strait, the author made for the largest of the outlying islands, which he called Neu Plauen, after his home, the famous manufacturing town near Dresden. Its summit, some 350 feet above sea level, affords a magnificent view over the Labrador coast, with stately headlands 2,000-2,500 feet high, and over the myriads of tiny islands, mostly flat, and affording breeding places to eiderducks. Great quantities of driftwood were strewn over the beach. All the shores in the vicinity are lined with ancient Eskimo houses, tent rings, fireplaces and graves. It would be a great mistake, however, to imagine that all these abandoned houses were inhabited at one and the same time, and hence to infer that the population was formerly more numerous. Eskimos even now build houses to please some special fancy, though there may be plenty of old houses close by, and a house once built remains forever, unless the alternative of frost and thaw causes it to slide slowly down into the sea, as happens occasionally, leading the unwary explorer into rash theories of recent land subsidence.

The rocks in the vicinity are exclusively igneous, no sedimentary rocks being found, except as erratics brought from a distance by the ancient ice. Numerous fissures, filled with white bands of quartz, reminding the Eskimos of slices of blubber, are seen to cross the smooth, polished surfaces of the gneiss, suggesting the possibility of ore deposits. That the land must at one time have stood much higher is evident at a glance from the numerous fiords, which are nothing else than drowned rivers, like Hudson River or Chesapeake Bay. It is suspected, in fact, that the glacial period was nothing else than a period of uplift. Were Labrador, eastern Canada and the northern United States raised even 5,000 feet above their present level, it is practically certain that a large part of them would once more be covered with an ice cap.

Compared, not with lands under the same latitude but with Arctic lands, this corner of Labrador seems fairly well dowered with animal and vegetal life. What of the "rational animal" for whose exclusive benefit the treasures of nature are supposed to exist? Life under the 60th degree of latitude is found decidedly endurable in

Europe, and thus from the geographic point of view there would be no obstacle to white colonization, especially since it would not have to face the long winter night, which at 80° N. lat. lasts 110 days, while at Cape Chidley the longest interval between sunset and sunrise, on December 21, lasts only 18 hours. The Newfoundlanders consider seal meat actually a delicacy. Perpetual rain is a condition to which the human tribe, like the anserine, eventually becomes accustomed, as proved in Scotland and in a part of our own State of Washington. When Hudson Strait becomes the avenue of a great commerce, which, according to A. P. Low, is sure to happen as soon as the Hudson Bay railway brings cargoes to a port on the west side of Hudson Bay, Killinek is bound to develop into a bustling port, and thus the great deterrent to the modern emigrant— isolation in the wilderness—will disappear. However, for some time to come, few white men other than missionaries and traders are likely to settle here, and thus the main human interest will continue to center in the Eskimos.

These good-natured, merry folk gained the author's amused sympathy, as they do that of every observer whose aim is to learn the truth rather than to tell a "spicy" story. At the time of the author's visit, the people were still heathen, but on March 1, 1908, the first lot of 18, having acquired the requisite convictions, were baptized, and 20 more were preparing for that transformation. A student of human nature can hardly fail to regret that some branch of this interesting "nation" of 40,000 souls, spread over all the Arctic coasts from Bering Strait to East Greenland, can not be kept in its primitive condition, with its own beliefs, traditions and habits undisturbed, except so far as may be desirable to save them from avoidable hardship. This, evidently, is not possible at Killinek, the future metropolis, nor hardly anywhere but in the Smith Sound region, the most northerly abode of human beings. Everywhere else, the natives are slowly but surely being drawn into the great leveling, equalizing stream of civilization. The presence of several halfbreeds, mentioned by Hantzsch, shows that in northern Labrador, as in Greenland, a process of colonization is going on which does not subject the "colonists" to the abrupt transfer from civilization to the wilderness. Through the natural preference of the natives themselves for the blood of the dominant race, Greenland, while remaining Eskimo in language, is fast becoming a white man's land. It is startling to see a blue-eyed man, and still more startling, a blue-eyed, golden-haired woman, beautiful enough to be an ornament to the most fashionable parlor, talking nothing but Eskimo, living on

blubber, in a hut made of sod, into which she has to crawl on hands and feet through a tunnel. Though not quite in harmony with the highest ethical ideas, this mode of displacement of one race by another is perhaps the gentlest. Nature here seems to reverse the law by which

"So careful of the type she seems,  
So careless of the single life."

One who has acquired even a slight knowledge of the Eskimo language naturally pounces with avidity on the geographic and other nomenclature in works dealing with Eskimo-inhabited lands. It is to be regretted that in Labrador, as in Greenland, the Eskimos seem to have a mania for adopting European names, which fit them about as well as European clothes. Such names as Tauyungina, Tautyengwa, Igia, Angutiwdluahsu, Nasautiwdluahsu, Niakautya, Masauna, Koyaugito, Inuito, for men, Adlekasingwa, Inedlungwa, Akatengwa, Awiengorna, Mahsangwa, for women, among the Smith Sound natives, seem infinitely more fitting than such borrowed labels as Carl Dalager, Christian Broberg, Hans Matthiessen, among the Danish Greenlanders. In Labrador, as in Danish Greenland, all the above names would doubtless show a final k, which in the Smith Sound region seems to have practically vanished, while final t has been softened to n, both changes being decidedly in the interest of euphony. The specimens of Eskimo words given by Hantzsch are an additional proof of the remarkable uniformity of the language throughout its vast extent, suggesting that the expansion of the race may be of comparatively recent date.

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## DISCOVERY OF THE NORTH POLE.

A cable despatch from Dr. Frederick A. Cook, dated "Lerwick, Shetland Islands, Sept. 1," and printed in the *New York Herald*, of that date, announced that he had succeeded in reaching the North Pole on April 21, 1908. This was followed by despatches received from Commander R. E. Peary, U. S. N., dated at Indian Harbor, Lab., *via* Cape Ray, N. F., Sept. 6, announcing also that he had reached the North Pole on April 6, 1909. As Peary's report is much more complete than that received from Dr. Cook, a summary of this great culmination of Peary's Arctic work will first be presented here. Detailed accounts of the reports of both explorers will be reserved for a later occasion.

Peary's steamer *Roosevelt* left New York on July 6, 1908, and